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Roundup

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ISS phone home!

Technology connects Space Station residents to JSC phone system

We're really enjoying it and getting a lot of use out of the Softphone.

- Jim Voss, pictured at right with the Softphone

By Eric Raub

Recently Steve Schadelbauer picked up the phone and had a brief chat with someone wanting to thank him for the work he did on a special project.

This was no ordinary call though.

The voice on the other end of Schadelbauer's line was current International Space Station resident James Voss. Voss wanted to thank Schadelbauer, an engineer at JSC, for helping make the phone he was using a reality.

Softphone, though not critical to keeping the outpost in orbit, has already become a luxury the crew would rather not live without.

"We're really enjoying it and getting a lot of use out of the Softphone," Voss said in a voicemail message left for Brett Parrish, another JSC engineer who also worked on the project. "Thanks a lot... It's great to have it on board."

The Softphone makes calling someone from orbit as easy as placing a call from any desk at JSC. Donning a headset plugged into their laptops, the astronauts can do something once confined to the realm of science fiction.

Now, local, long-distance and international are no problem for the system. To reach anyone with a JSC extension, the ISS crew need only dial a five-digit extension. If they want to call someone outside the center they must first dial nine.

This is a major revolution in the way people in space communicate with those on Earth. For decades the only way to communicate with astronauts was via radio, which has several limitations and relatively low signal quality. Only the privileged Capsule Communicator (CAPCOM) was able to remain in contact with astronauts. Limitations existed on where–or even when–the astronauts' families could talk with them over the old radio system.

"In the past the CAPCOM was the one that talked to the astronauts and that was it– period," Parrish said. "There were a few exceptions like flight surgeons, the President or the family in a protected room. Now it's as comfortable as calling from the office, which is something we take for granted. But if you're in a tin can for six months, it's a long time to go without talking to your kids or your spouse."

Now the astronauts can call home every night to ask their family about their day, the weather or whatever they want to talk about. "We can do pretty much anything you see, communication wise, in science fiction movies," Parrish said. "In '2001: A Space Odyssey,' Dr. Floyd makes a call home from a station in flight by dialing at will from a phone booth...It cost Dr. Floyd $1.70, the astronauts get it for free."

Interestingly enough, the extension for the first unit on STS-98 was 2001.

The phone is the realization of the dreams of many people. Cisco Systems updated the phone system for communications operations on the ground like those within the Mission Control Center and between certain directorates. As a nice extra, Cisco offered to reengineer their software phone program Softphone.

The Softphone's program design needed work to be able to survive the NASA satellite network. The network sometimes requires signals to be bounced around for tens of thousands of miles before reaching their target –in this case the ISS.

Technical problems arose involving signal delay and the inability of the Shuttle and ISS communication systems to carry IP "packets" of information. Cisco engineers revamped their program, free of charge, until it could handle all of the difficulties. Cisco's press release on the accomplishment bore the title "The first 90,000 miles are toll-free."

Astronaut Marsha Ivins was one who pushed for the phone system's development since she first tested the unit onboard the shuttle during the STS-98 mission. When everyone realized the success and capability of the system, the phone made about 20 more "test" calls before the orbiter returned.

When word spread that the phone not only worked but worked well, the next step became making it a permanent feature of the ISS. Voss and fellow astronaut Susan Helms became what Parrish described as "technology evangelists" until mid-May, when the ISS finally got what so many people take for granted–a phone.

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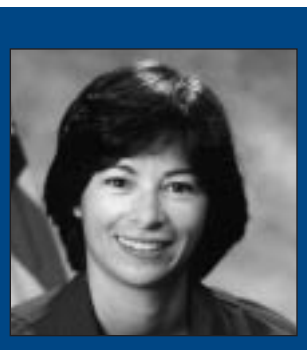
Just-*the*-FACTS

- The phone is based on a computer program called "Softphone" modified to work with existing communication links.
- The program is loaded onto the astronauts' laptops, and headsets are plugged in to talk and listen.
- The phone works like any phone at JSC–local, long-distance and international calls are no problem.
- The phone is fully duplex, with no need for saying "copy" or "over."
- The sound quality is better than radio frequency.
- High-quality music can also be sent through the same system.
- While the ISS residents can call anyone, the ISS Softphone can only receive calls from Mission Control.



Astronaut Patty Robertson dies.
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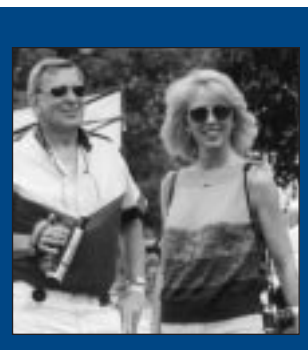

Family ties at Johnson Space Center.
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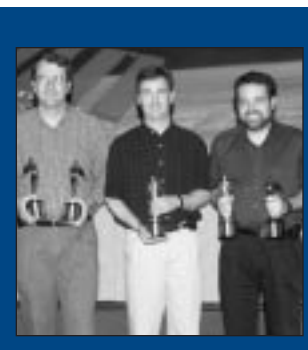

Three win Telly Awards.
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